

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A method for allowing multiple types of clients to use a database application without hard-coding presentation logic for each of the multiple types of clients into the database application, the method comprising the steps of:
- receiving, from a particular client, a request for data that is to be used by the particular client in a user interface, wherein the user interface is operable to receive input from a user and to cause entry of the input into the database application;
- prior to providing the data from the database application to [[a]] the particular client, performing the steps of:
- converting the data that is to be transmitted from the database application to the particular client into an XML output without regard to the device type of the particular client by performing certain steps that include:
- identifying a data type to which the data corresponds, ~~wherein~~
~~the data type reflects a type of the data that is read out of~~
~~the database~~ wherein the data that is to be transmitted from the database application to the particular client comprises a message that is to be displayed in the user interface;
- selecting from a plurality of document type definitions, a document type definition associated with said data type, wherein said document type definition includes: (a) at least one attribute indicating a message type of said message, wherein said message type is any one of a normal message, an error message, a warning message, and a hint message, and (b) at least one attribute indicating how to display said message in said user interface; and
- converting the data to the XML output based on said selected document type definition;

29 identifying the particular client device type of the particular client, wherein the
30 particular client device type indicates one of a dumb terminal, a telnet
31 terminal, a bar code scanner, and a browser-less device;
32 wherein sets of metadata are each associated with a client device type of a
33 plurality of client device types and indicates how to convert said XML
34 output to output for the client device type;
35 selecting, based on the particular client device type, a particular set of
36 metadata from among the sets of metadata;
37 ~~reading the particular set of metadata;~~ and
38 based on the particular set of metadata, converting the XML output to output
39 for the particular client device type; and
40 providing the output for the particular client device type to the particular client.

1 2. (Previously Presented) The method of Claim 1 wherein:
2 the step of reading the particular set of metadata includes reading an XSL style sheet
3 associated with said particular client device type; and
4 the step of converting the XML output includes applying the XSL style sheet to said
5 XML output.

1 3. (Previously Presented) The method of Claim 1 wherein the step of converting the data
2 that is to be transmitted from the database application to the particular client into an
3 XML output includes converting the data based on one or more document type
4 definition files.

1 4. (Previously Presented) The method of Claim 1 wherein:
2 the particular client is a Telnet client;
3 the Telnet client communicates with a Telnet server to request data from said database
4 application; and
5 the step of providing said output to said particular client includes the steps of
6 sending the output to said Telnet server using a recipient specific format; and
7 said Telnet server providing said output to said Telnet client.

1 5. (Canceled)

1 6. (Original) The method of Claim 1 wherein the XML output includes display
2 instruction data indicating that said data is to be displayed in a first manner.

1 7. (Previously Presented) The method of Claim 6 wherein the step of converting the
2 XML output includes the step of generating output for said particular client device
3 type that causes said data to be displayed in a second manner that is different than said
4 first manner when said particular client device type is not able to display said data in
5 the first manner.

1 8. (Currently Amended) A method for using a database application with multiple clients
2 that support multiple mark-up language interpreters without hard-coding into the
3 database application logic to support each of the multiple mark-up language
4 interpreters, the method comprising the steps of:

5 receiving, from a particular client, a request for first data that is to be used by the
6 particular client in a user interface, wherein the user interface is operable to
7 receive input from a user and to cause entry of the input into the database
8 application;

9 converting output of the database application to the first data that conforms to a first
10 mark-up language without regard to the type of mark-up language interpreter
11 supported by ~~[[a]]~~ the particular client to which the ~~output~~ first data is to be
12 sent by performing certain steps that include:

13 identifying a data type to which the first data corresponds, ~~wherein the~~
14 ~~data type reflects a type of the data that is read out of the~~
15 ~~database~~ wherein the first data comprises a message that is to
16 be displayed in the user interface;

17 selecting from a plurality of document type definitions, a document
18 type definition associated with said data type, wherein said
19 document type definition includes: (a) at least one attribute

20 indicating a message type of said message, wherein said
21 message type is any one of a normal message, an error message,
22 a warning message, and a hint message, and (b) at least one
23 attribute indicating how to display said message in said user
24 interface; and
25 converting the first data to XML output based on said selected
26 document type definition;
27 wherein a plurality of mark-up languages are each associated with one or more client
28 device types of a plurality of client device types, wherein the plurality of client
29 device types include at least one of a dumb terminal client device type, a telnet
30 terminal client device type, a bar code scanner client device type, and a
31 browser-less client device type;
32 selecting, based on a client device type ~~to which the output is to be sent~~ of the
33 particular client, a second mark-up language of said plurality of mark-up
34 languages that is different than said first mark-up language;
35 converting the ~~first data~~ XML output to second data that conforms to the second
36 mark-up language; and
37 sending the second data to the particular client.

1 9. (Currently Amended) The method of Claim 8 wherein the step of converting the ~~first~~
2 ~~data~~ XML output to the second data is performed by applying an XSL style sheet to
3 said ~~first data~~ XML output.

1 10. (Original) The method of Claim 8 wherein the step of sending the second data to the
2 client includes sending the data to a server to which the client is connected through a
3 wireless connection, and then sending the data from the server to the client over said
4 wireless connection.

1 11. (Canceled)

12. (Currently Amended) A system comprising:

a database system;

a database application operatively coupled to said database system;

said database application including:

application logic that:

receives a request for first output that is to be used by a client device in
a user interface, wherein the user interface is operable to
receive input from a user and to cause entry of the input into the
database application;

retrieves data from said database system to produce [[a]] the first
output in a format that is independent of a type of the client
device that is to receive the first output;

an XML processor that:

identifies a data type to which the data retrieved from the database
system corresponds, wherein the data comprises a message that
is to be displayed in the user interface;

identifies a document type definition associated with said data type,
wherein said document type definition includes: (a) at least one
attribute indicating a message type of said message, wherein
said message type is any one of a normal message, an error
message, a warning message, and a hint message, and (b) at
least one attribute indicating how to display said message in
said user interface; and

applies the document type definition to the data retrieved from the
database system, thereby formatting the first output data into
XML to produce second output that is independent of the type
of the client device that is to receive the first output; and

an XSL processor that converts the second output into ~~a third~~ the first output
based on an XSL style sheet associated with the type of the client

30 device that is to receive the first output; wherein the XSL style sheet is
31 selected based on the type of the client device.

1 13. (Original) The system of Claim 12 further comprising:
2 a plurality of servers operatively coupled to said database application;
3 said plurality of servers including at least a first server configured to provide services
4 to clients that support a first protocol and a second server configured to
5 provide services to clients that support a second protocol that is different from
6 said first protocol; and
7 a plurality of clients including a first client that interacts with said database
8 application through said first server and a second client that interacts with said
9 database application through said second server.

1 14. (Currently Amended) A computer-readable medium carrying instructions for allowing
2 multiple types of clients to use a database application without hard-coding
3 presentation logic for each of the multiple types of clients into the database
4 application, the instructions including instructions for performing the steps of:
5 receiving, from a particular client, a request for data that is to be used by the particular
6 client in a user interface, wherein the user interface is operable to receive input
7 from a user and to cause entry of the input into the database application;
8 prior to providing the data from the database application to [[a]] the particular client,
9 performing the steps of:
10 converting the data that is to be transmitted from the database application to
11 the particular client into an XML output without regard to the device
12 type of the particular client by performing certain steps that include:
13 identifying a data type to which the data corresponds, wherein
14 the data that is to be transmitted from the database
15 application to the particular client comprises a message
16 that is to be displayed in the user interface;
17 selecting from a plurality of document type definitions, a
18 document type definition associated with said data type,

19 wherein said document type definition includes: (a) at
20 least one attribute indicating a message type of said
21 message, wherein said message type is any one of a
22 normal message, an error message, a warning message,
23 and a hint message, and (b) at least one attribute
24 indicating how to display said message in said user
25 interface; and
26 converting the data to the XML output based on said selected
27 document type definition;
28 identifying the particular client device type of the particular client, wherein the
29 particular client device type indicates one of a dumb terminal, a telnet
30 terminal, a bar code scanner, and a browser-less device;
31 wherein sets of metadata are each associated with a client device type of a
32 plurality of client device types and indicates how to convert said XML
33 output to output for the client device type;
34 selecting, based on the particular client device type, a particular set of
35 metadata from among the sets of metadata;
36 ~~reading the particular set of metadata;~~ and
37 based on the particular set of metadata, converting the XML output to output
38 for the particular client device type; and
39 providing the output for the particular client device type to the particular client.

- 1 15. (Previously Presented) The computer-readable medium of Claim 14 wherein:
2 the step of reading the particular set of metadata includes reading an XSL style sheet
3 associated with said particular client device type; and
4 the step of converting the XML output includes applying the XSL style sheet to said
5 XML output.

- 1 16. (Previously Presented) The computer-readable medium of Claim 14 wherein the step
2 of converting the data that is to be transmitted from the database application to the
3 particular client into an XML output includes converting the data based on one or
4 more document type definition files.
- 1 17. (Previously Presented) The computer-readable medium of Claim 14 wherein:
2 the particular client is a Telnet client;
3 the Telnet client communicates with a Telnet server to request data from said database
4 application; and
5 the step of providing said output to said particular client includes the steps of
6 sending the output to said Telnet server using a recipient specific format; and
7 said Telnet server providing said output to said Telnet client.
- 1 18. (Canceled)
- 1 19. (Original) The computer-readable medium of Claim 14 wherein the XML output
2 includes display instruction data indicating that said data is to be displayed in a first
3 manner.
- 1 20. (Previously Presented) The computer-readable medium of Claim 19 wherein the step
2 of converting the XML output includes the step of generating output for said
3 particular client device type that causes said data to be displayed in a second manner
4 that is different than said first manner when said particular client device type is not
5 able to display said data in the first manner.
- 1 21-23. (Canceled)

1 24. (Currently Amended) The system of Claim 12, wherein the type of client device
2 comprises at least one of a dumb terminal, a telnet terminal, a bar code scanner, and a
3 browser-less device.

1 25. (Canceled)

1 26. (Currently Amended) The method of Claim 1, further comprising:
2 receiving, from the particular client, a second request for second data that is to be used
3 by the particular client in the user interface; and
4 prior to providing the second data from the database application to the particular
5 client, performing the steps of:
6 converting the second data into a second XML output without regard to the
7 device type of the particular client by performing certain steps that
8 include:
9 identifying a second data type to which the second data corresponds,
10 wherein the second data type indicates that the second data is at
11 least one of a data entry form, a queried data, ~~a message~~, a form
12 level query data, and a field level query data;
13 selecting from the plurality of document type definitions, second
14 document type definition associated with said second data type,
15 wherein said second document type definition includes one or
16 more attributes indicating how to display said second data in
17 said user interface; and
18 converting said second data to the second XML output based on said
19 second document type definition;
20 selecting, based on the particular device type, a second set of metadata from
21 among the sets of metadata; and
22 based on the second set of metadata, converting the second XML output to the
23 output for the particular client device type;

24 wherein the step of providing the output to the particular client further comprises
25 providing to the particular client the output that includes the second XML
26 output.

1 27. (Currently Amended) The system of Claim 12, wherein:
2 the data further comprises ~~the data type indicates~~ at least one of a data entry form, a
3 queried data, ~~a message~~, a form level query data, and a field level query data;
4 and
5 the data type definition is included in a plurality of document type definitions that the
6 XML processor is configured to access, wherein the plurality of document type
7 definitions include at least one document type definition associated with at
8 least one data type for each of the data entry form, the queried data, the form
9 level query data, and the field level query data, and wherein the at least one
10 document type definition includes one or more attributes indicating how to
11 display in the user interface each of the data entry form, the queried data, the
12 form level query data, and the field level query data.

1 28. (Currently Amended) The computer readable medium of Claim 14, further including
2 instructions for performing the steps of:
3 receiving, from the particular client, a second request for second data that is to be used
4 by the particular client in the user interface; and
5 prior to providing the second data from the database application to the particular client,
6 performing the steps of:
7 converting the second data into a second XML output without regard to the
8 device type of the particular client by performing certain steps that
9 include:
10 identifying a second data type to which the second data corresponds,
11 wherein the second data type indicates that the second data is at
12 least one of a data entry form, a queried data, ~~a message~~, a form
13 level query data, and a field level query data;

14 selecting from the plurality of document type definitions, second
15 document type definition associated with said second data type,
16 wherein said second document type definition includes one or
17 more attributes indicating how to display said second data in said
18 user interface; and
19 converting said second data to the second XML output based on said
20 second document type definition;
21 selecting, based on the particular device type, a second set of metadata from
22 among the sets of metadata; and
23 based on the second set of metadata, converting the second XML output to the
24 output for the particular client device type;
25 wherein the step of providing the output to the particular client further comprises
26 providing to the particular client the output that includes the second XML
27 output.